

Topology and Correlation in Quantum Materials with Strong Spin-Orbit Coupling

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Topological phases of quantum materials hold the promise for robust physical properties that cannot easily be changed by microscopic details. In the last decade, much progress has been made for weakly interacting electron systems with band topology. Recently the intertwined action of topology and electron interaction has been an important topic of research. In particular, emergence of topological phases in presence of electron interaction and strong spin-orbit coupling opens the possibility of controlling topological phases by magnetism. We will review some of recent progress in this direction, including examples of quantum spin liquids, topological superconductivity, and topological magnons.